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SUSTAINABLE TRANSPORTATION SCHEME IN UNIVERSITY: STUDENTS' INTENTION ON BIKE SHARING SYSTEM: AN EMPIRICAL APPROACH

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Abstract

There are growing interest and concern with the concept of sustainable transport due to the high growth of energy consumptions and greenhouse-gas effects from transport sector. Bike sharing system appears to be cost-effective and a sustainable way to travel for a shorter distance. University is an ideal place to implement this system. However, previous researcher reported that most of the university's students commonly relied on the motorized vehicle to commute. This study aimed to determine students' intention to use the bike sharing system in campus. Ajzen's Theory of Planned Behavior (TPB) taken as the underpinning theory. Attitude, subjective norms and perceived behavioral control are the predictor variables involved in the study, and students' intention is the criterion variable. The data were collected from 375 full time undergraduate students of University Utara Malaysia (UUM) through a self-administered questionnaires. Proportionate stratified sampling method has been used where population were divided into three strata according to gender, race and college. The findings observe for the correlation of all the variables involved in the study. This study will be beneficial to UUM by offering valuable information regarding students' intention to use the bike sharing system in campus. This study will also help to better understand the students' intention towards embracing sustainable transport and validating their awareness on the importance of sustainable transportation. Furthermore thus encourage and enhance the development of ethical behavior among them toward appreciating, preserving and protecting the environment.

Keywords: *Bike Sharing System, Intention, Theory of Planned Behavior, Sustainable Transportation, Ethical Behavior, Preserving.*

1. Introduction

It is known that transportation is one of the essential parts in our daily lives. We cannot neglect the impacts of transportation to social, economic and environment (Rodrigue & Notteboom, 2013). However, the impact of transportation to the environment is commonly

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viewed as negative. Transportation is the largest end-use contributor toward global warming in the United States and many other developed countries (Wakeland, Cholette & Venkat, 2012). This can be explained where transportation responsible for emitting nearly two billion metric tons of CO_2 in the United States each year (Goldsby, Iyengar & Rao, 2014). Due to the high growth of energy consumption and greenhouse-gas emissions from transport sector, there is growing interest and concern with the concept of sustainable transport (Okyere, 2012).

Growing transportation activity will result in increasing greenhouse-gas emissions and energy use, unless increasing the energy efficiency of vehicles, developing alternative energy sources as well as found the way to increase the ability of land use and transportation system to provide accessibility with less motor vehicle travel. (Tahzib & Zvijakova, 2012). However, reducing these impacts has already been a legislated objective since 2010 (Doyle, 2014).

At the moment, there is growing interest and concern with the concept of sustainable transport due to the high growth of energy consumption and greenhouse-gas emissions from transport sector (Okyere, 2012). According to Rastogi (2011), sustainable transportation allows the basic access and development needs of individuals, companies and society to be met securely in consistently with human and ecosystem health, and promotes equity in between successive generations. Sustainability defined in narrow, which focus on the resource depletion and the air pollution problems such as reduce transportation fossil fuel consumption and CO_2 emissions from motorized transport. (Litman & Burwell, 2006).

Having a sustainable transportation system is not just a preference, but it is needed for Asian cities to meet a growing demand as well as to maintain or improve their living quality for the city residents. According to research of Rastogi (2011), non-motorized transportation mode with low energy consumption and resources, which make them viable options for sustainable transportation. Bicycling and walking are the most efficient and environmentally sustainable means of making short trips (Hook, 2005).

Bike share programs appear to be the cost-effective and sustainable way to widen transit options' portfolio among the available policy and solutions (Kisner, 2011). It has been increasing popular with its innovation as a form of public transportation open to public (Parkes, Marsden, Shaheen & Cohen, 2013). Since the mid of 2000s, bike sharing system has rapidly growth where there are more than 700 cities implementing the bike sharing system (Midgley 2015). The general concept within a bike sharing system is multiple bicycles will be set aside for short-term bicycle rental use, which enables bicycles being picked up at any self-serve station and returned to any other station (Midgley, 2010).

There are four generations of bike share up until now. The first generation within the bike sharing system is known as "White Bike" started in Amsterdam in 1965, with free of charge provided for public used where bicycles were painted in white colour placed throughout in an area (Shaheen & Guzman, 2011). However, this programme has ended up with the problems of bicycles being stolen and damage after few years. In 1995, second generation of bike share was introduced in Copenhagen with the coin-deposit system in order to solve the problem happened in the first-generation programme (Shaheen, Guzman & Zhang, 2010). In this coin-deposit system, bicycles are locked, and it is needed to insert coin into a dock in order to unlock the bicycles for a secure purpose. Anyhow, this does not charge for users as the public can get their coin back when check-out the bicycle to a dock.

In 1998, the third generation of bike sharing is born in Rennes, France, which upgraded with smart card access for pick-up and drop-off at dock (Midgley, 2010). The smart card or mobile phone access was incorporated under the transaction kiosk to identify users who may reduce theft rates (Bachand-Marleau, Lee & El-Geneidy, 2012). In 2005, third generation of bike was further installed with global positioning system (GPS) tracking and real-time availability being introduced in Lyon, France (Midgley, 2010). In 2009, the fourth generation of bike share was implemented in Montreal, Canada corresponded with demand responsive and multimodal system (Shaheen, Guzman & Zhang, 2010). BIXI is referring to contraction of bicycle, and taxis were designed to specifically for shared use in urban, which have the characteristics of adjustable seats, front racks and integrated chain protector (Bachand-Marleau, Lee & El-Geneidy, 2012).

Bike sharing is an ideal transportation mode that works best for shorter point-to-point distances beyond reach on foot (Sotero, 2015). This is because bike sharing able to increase connectivity among community, university or even a corporate university in a natural way (Gardner & Gaegauf, 2014). In addition, bike sharing emits an absolute minimal amount of CO2, which acts as a practical alternative transit mode (Gardner & Gaegauf, 2014). This is why bicycle is the most energy-efficient vehicle currently, and it helps in reducing carbon emissions and other harmful pollutants.

According to Laurence Doxsey who is the San Antonio's Environment Policy Director, bike sharing program achieved win-win situation as it helps improve the environment through reduce dependence upon fossil fuels and at the same time encourage people through physical activity (Lester, 2010). According to Natural Resources, Defense Council (NRDC, 2013), bike sharing encourages physical activity, which shifts people from passive to active transport, which could keep weight under control, improve cardiovascular health, muscle tone and coordination. As for mentally aspect, bike sharing able to reduce stress as well as keeping weight under control (NRDC, 2013). Indeed, bike sharing system has great influence on brings about larger cycling population, lessen environmental impacts, which may decrease greenhouse gases and improve public health.

2. Problem Statement

Universities are the ideal places for bike sharing systems. This is because of three key issues, which are financial limitations, air quality issues, and shrinking land availability faced by most universities (Fund, et al. 2012). Moreover, universities are known as "small cities" which will have direct and indirect impacts on environment as their large-size population and various activities being carried out in campuses (Alagbe & Alalade, 2013). In addition, universities are the most ideal hub for innovation and idea's development as well as establish awareness on how to integrate sustainability in daily life (Jain & Pant, 2010). Bike sharing system has been a visible and tangible pace towards greener campus where it shows a long-term commitment to better transportation and healthy living (Heda, 2012). According to the study conducted by European Cyclists' Federation (ECF) stated that emissions from cycling are over 10 times lower than from car (Blondel, Mispelon & Ferguson, 2011). Still, bike share can move more people at a lower cost and brings more benefits to health and environment compared with other transportation modes (Gardner & Gaegauf, 2014). There are more than 65 colleges, and universities promote the bike sharing programme as sustainable transportation throughout North America, which includes CibiUAM at Universidad Autonoma de Madrid (UAM) in Spain and Velocampus Leeds at University of Leeds in United Kingdom (Shaheen, Guzman & Zhang, 2010).

However, the study (Toit, 2013) conducted at University of Pretoria, South Africa showed that individual private cars dominate the mode of transport used in their campus as it generated more than half of all trips within the main campus. Besides that, previous research conducted in Universiti Kebangsaan Malaysia (UKM), there are 81% of students involved in riding bus and private car within the campus (Makki, et al., 2012). Thus it can be said that motorized-vehicles still is the main transportation mode used by university students.'.

Therefore, there is a need to promote the bike sharing system in campus to achieve sustainable goals. Before implement the system in campus, it is important to determine the intention of students to use this system in campus. This study is the first to explore the behavioral factors underlying the students' intentions to use the bike sharing system in campus. It is supported by Theory of Planned Behavior (TPB) where the theory states that performance of a behavior is determined from one's intention. In turn, attitudes toward the behavior, subjective norms and perceived behavior controls are combined to produce intention (Ajzen, et al., 2011). As such, there needs to be a greater understanding about the relationship of attitude, subjective norms and perceived behavior control towards students' intention.

3. Research Question

i. Do attitude plays an imperative role in affecting students' intention to use the bike-sharing system in campus?
ii. Do subjective norm plays an imperative role in affecting students' intention to use the bike-sharing system in campus?
iii. Do perceived behavioral control plays an imperative role in affecting students' intention to use bike-sharing system in campus?

4. Objective of Study

In the research paper, the objective is to determine students' intention to use the bike-sharing system in campus based on Theory of Planned Behavior as well as the correlation of all the variables involved in the study.

i. To determine the relationship between attitudes and students' intention towards the bike sharing system.
ii. To determine the relationship between perceived behavior control and students' intention towards the bike sharing system.
iii. To determine the relationship between subjective norm and students' intention towards the bike sharing system.

5. Literature Review

5.1 Bike Sharing System

According to Wine (2012), there are over 100 cities in Europe and 21 cities in the United States that implemented bicycle sharing system. A bike sharing system is a network of bicycles and kiosks that residents, tourists and students can unlock and ride for a short time, then return to any station (Wine, 2012). The general concept is that multiple bicycles which are owned by no single individual will be set aside whether use in a region, city, town,

campus, business or college department for short-term communal and anyone in the community can have access to the bicycles, according to time, cost, and type of journey limitations (Kenney, 2012).

According to Grace Kenney, study coordinator of bike sharing feasibility study (2012), promote bicycle sharing instead of focus only on the improvement of bicycle culture as people decide to own a bicycle when they interested in riding and feel comfortable. Riding a bicycle compared to take the bus, walking, or driving a car but often do not use them as much as they could. Convenience and the desire to avoid theft of private bike found to be main facilitators for bike sharing system use (Bachand-Marleau, Lee & El-Geneidy, 2012). Bike sharing system is a good alternative for them as they can use the bicycle and no need to bear the costs and responsibilities associated with owning a bicycle for short trips within the service area of the system (Imani, et al., 2014).

Impact of the bike sharing system in campus cannot be neglect. Ashley (2012) in National Conference on Undergraduate Research (NCUR) stated that instituting a bike sharing system at Bridgewater State University may impact the university in many positive ways such as decrease traffic congestion, number of parking spaces needed on campus and number of miles the shuttle is run as well as the number of shuttle services that are offered on campus, which could reduce global resource consumption and greenhouse emissions. From the perspective of individual who would use the bike sharing system, cycling promotes a healthy lifestyle that improves their physical and mental health and their well-being, while reducing the risk of premature death and ill health (Allan, 2015). Additionally, biking is an efficient, healthy, and affordable transportation option for Indiana University Bloomington (IUB) students, faculty, and staff was stated on the report of Sonoff (2012).

Malaysia has an equatorial climate with uniformly high temperatures, high humidity, relatively light winds, and abundant rainfall throughout the year (McGinley, 2011). The intention of Malaysian students to use the bike sharing system in campus in this kind of weather is needed to determine. This is because in a previous study of Imani et al. (2014), it is observed that people are more likely to use a bicycle sharing system under good weather conditions. Besides, in the study of Jalalkamali & Ghraeib (2012) on the biking potentials of Malaysian students in UITM campus, it concluded topography of the university, and the weather constraints are the most influenced factors to use of bicycle. In addition, the study of Jen & Shih (2015) expressed that system cognition and environmental cognition are the important factors to affect people's intentions to use YouBike (the first Public Bike System in Taipei) for commuting based upon the cross-over analysis.

The studies for bike sharing are still limited, and we can note that most of these are conducted in western country, and it is not easy to find related researches on the bike sharing system for the East-Asia region (Jen, T.P. & Shih, Y.P., 2015). We know that there is cultural difference between west and east country and then the success of bike sharing in west is possibility not adaptable in east. Thus there is a necessary to conduct more research on the bike sharing system in the East-Asia region, including Malaysia.

5.2 Intention

Intention is the introduction to the notion of practical knowledge into a contemporary philosophical discussion of action, and it is said that what people perform is not based on observation (Moran, 2004). Intention can be deduced from an individual's responses or speaks such as "I intend to do X", "I will do X" or "I plan to do X" (Sheeran, 2002). Intention

summarizes all the pros and cons that bring into consideration. When decide whether to carry out certain action (Souza, Sanches, & Ferreira, 2014).

Intention can be classified into three, which are positive, negative and unintended (Geib, 1992). It is explained that positive intention is referring to a person committing to conduct a behavior at a specific of time. In contrast, negative intentions interpreted that a person committed not to conduct that action or the action is avoided to carry out. Furthermore, unintended action described that specific behavior which is not considered as positive or negative due to no commitment.

Theoretically, researchers have been arguing that intentions are viewed as the immediate antecedents of corresponding overt behaviors (Fishbein, M. & Ajzen, I., 1975). In several social-psychological models of behavior, intention is the key index of one's mental readiness to act (Sheeran, 2002). Intention often has been looked upon the basis to practice a behavior and most important single element in determine plans in future (Audi, 1991). It is proved that intention is the most immediate and important predictor of one's behavior in protection motivation theory (Rogers, 1983). It has confirmed the truth where the gap between intention and behavior is not negligible even though there are a lot of measurements being used to affect the consistency of intention behavior (Sheeran, 2002).

Intention has been broadly used in academic and commercial research as it represents easy-to-collect proxies of behavior (Chandon, Morwitz & Reinartz, 2005). For example, research had been done on intentions to use bike sharing for holiday cycling by applying the theory of planned behavior (Kaplan, et al., 2014), antecedents of the luxury brand purchase intention (Peng, et al., 2011), consumer purchase intention for organic personal-care products (Kim & Chung, 2011) and factors affecting students' intentions to study at universities adopting the "students-customer" concept (Watjatraku, 2013).

However, a research found that intention may not necessarily as the measure of behavior. A study on brand purchase behavior showed that explanatory power of intention appears near zero in the loyal segments and in the wide brand experience segment (Bonfield, 1974). According to Ajzen & Fishbein (1977), it is explained that intention may not predict behavior as behavior has different core elements such as place setting, action timing and the action context. There are some theories used to measure intention, which includes Theory of Planned Behavior (TPB), Theory of Reasoned Action (TRA) and Technology Acceptance Model (TAM). Among the theories used to measure intention, TPB is selected to adopt in this research as TPB appears to be more suitable in measuring intention based on the previous study done.

Indeed, there are quite a number of researches being done to predict and understand ones' intention to engage in certain mode of transportation that relying on TPB. A reseach was conducted on the basis of TPB to predict intention towards bicycle commuting to university among students in Zagreb where results showed that the predictors used under TPB significantly affects intention where attitude toward bicycle use being the best predictor, followed with perceived behavioral control and subjective norm (Milković, M. & Štambuk, M., 2015). Even though there are limitations, the findings have confirmed the usefulness of TPB components for the study. Besides that, a research was done in predicting active school travel children with aged eight to nine years from five elementary schools in the west of Scotland. The results revealed that TPB significantly predicted children' active school travel where it is accounted of 41% of the variance in intention to walk to school (Murtagh et.al,

2012). In addition, there was a research done to understand the intentions to use bike sharing for holiday cycling by applying TPB. The results from this research revealed behavioral intentions for holiday cycling is associated with TPB constructs (Kaplan, Manca, Nielsen & Prato, 2014). It is clearly shown that intention had strong association with a behavior through TPB. In order to measure students' intention to use the bike sharing system in campus, TPB is selected to adopt rather than TRA and TAM.

5.3 Theory of Planned Behavior

Theory of planned behavior (TPB) was developed by Icek Ajzen in 1988. This theory has been widely used to cite and applied under behavioral theories. From TPB, intention has been defined as how hard a person willing to try and how much the effort that one's plans to exert in perform a given behavior (Ajzen, 1991). TPB is the extension to the theory of reasoned action (TRA) where it is based upon the assumptions that ones will usually behave in a sensible manner through considering the implication of the actions (Ajzen, 1985).

Under TRA, there are only two independent factors used to determine intention, which is attitude and subjective norm. This theory is found not to be adequate and had several limitations as TRA only works successfully under individuals' volitional control. Hence, TPB was developed by adding third element, which is perceived behavioral control in dealing with behaviors over the people has incomplete volitional control (Ajzen, 1991). Based on TPB, intention to perform a behavior is affected by three factors where they are the psychological concepts that independent of each other includes attitude towards the behavior, subjective norm and perceived behavior control. These three elements in TPB control account for substantial variance in intentions and shows the significant relationship with intention through meta-analysis reviews (Ajzen, 1991; Godin & Kok, 1996; Sheppard, Hartwick & Warshaw, 1988; Armitage & Conner, 2001; Sheeran & Taylor, 1999).

Through extensive research based on theory of planned behavior, intention is a proxy measure to predict a person's behavior for the future. According to Ajzen (1985), intentions control a person's action or behavior, but there are not all intentions are performed as some of the intentions are abandoned while some are revised to fit changing circumstances. Furthermore, there is profound misunderstanding of TPB, misinterpret of negative findings and fail to place the work properly in applying TPB (Ajzen, 2014). Consequently, TPB is proved and maintained to be suitable for understanding human behavior even though there are critics from Sniehotta argued on TPB's failures.

Quantifiable measurement methodologies are available to monitor the intention level. According to Perugini & Bagozzi (2001), intention can be quantitative measured as on a 7-point scale anchored by very unlikely to very likely (as cited in Park & Petrick, 2009). The scale of measure can be varied such as strongly disagree-strongly agree, definitely not-definitely yes and definitely will not–definitely will (Ajzen, Joyce, Sheikh, & Cote, 2011).

5.4 Attitude

Theory of planned behavior (TPB) explains that attitude towards behavior is affected by the belief that the behavior will lead to the wanted or unwanted results (Kusumawati, et al., 2014). Attitude can describe an individual's positive or negative feeling when a person was performing on certain target behavior (Mehra & Omidian, 2011). Besides that, attitude also can be said as an individual's favorable or unfavourable feelings and evaluations based on their performing to a particular behavior (Mir & Rehman, 2013).

According to Isah, et al. (2015), attitude has three components, which are an effect (feeling), congnition (belief or thought) and behavior (action); although the components of attitudes consider an internal to a person, but it can be clearly viewed through individual's behaviors. Attitude towards specific behaviors has to become one of a determinant for the intention, which in turn will determine whether the behavior will be performed or not (Kusumawati, et al., 2014). Once an individual has a positive attitude to a certain situation, it will affect an individual's behavioral intentions positively; on the other's hand, if an individual has a negative attitude, it will affect their intention negatively (Mir & Rehman, 2013) . Thus, if the features from the images to a person are intelligent, attractive, and witty; their attitudes towards the intention will presumably be quite favorable while in another hand if the features from the images or vision are dull, unattractive, and boring, it will affect their intention to be unfavourable (Fein & Hilton, 1990).

It is shown that there is a relationship between attitude and intention in several previous studies (Farahbod, et al. (2013); Shah, et al (2012); Ghorban (2012); Alam & Sayuti (2011); Mir & Rehman (2013). However, there was an arguement from a study by Lee (2010), saying that there had no obvious or significant effect among the attitude of perceived enjoyment on the continuance intention; because when users log into an e-learning platform, they not only want to learn the online course, but also want communicate with others and enjoy themselves, and thus seeking a flow experience. Similarly, another argument in study of Kwan & Bryan (2010), the result showed that they cannot distinguish between the actual affective experience of engaging in aerobic exercise and subsequent affective attitudes towards intention exercise, and cannot speak to how they may have similar effects on exercise motivation and behavior. Thus, further study of the relationship between attitude and intention is needed.

5.5 Subjective norm

Subjective norm is one of the elements of TPB, which is a form of an injunctive social norms as it concerned with one's motivation to comply with the beliefs of important referents (Lapinski & Rimal, 2005). It is referring to one's perception of social pressures towards the behavior where the social pressures come from parents, friends, culture and public institutions (Ajzen, 1991). Close family, partner or friends and the community lived in were all important in shaping subjective norms, which lead to intention (Van Hooft & De Jong, 2009). In the research study of predicting bicycle commuting among students in Zagreb, subjective norm is linked to the country of residence and road behavior towards cycling because it has direct impact on cyclist's fear to traffic and self-exclusion from cycling together (Milković & Štambuk, 2015).

A person will have greater intention to act towards the behavior if the more positive the subjective norms is (Souza, Sanches & Ferreira, 2014) because subjective norms function as a force pushing one to perform in a particular way (Bagozzi, 1992). The intention will be higher as there is more supportive for subjective norms (Krithika & Dr. B.Venkatachalam, 2014). It can be said that the broader the individual's network relationship, the greater is the social pressure.

Subjective norms have proven to have impacts on person's intention on using mode of transportation. Generally, a research shown the subjective norm towards car use is positive as people tend to think others expect them to travel by car (Dijst, Rietveld & Steg, 2013). It is explained that the more positive subjective norms towards driving a car, the more people will actually drive their car. Similarly, there is a result from a study showed that stronger

subjective norm in favor of car use will positively lead to car use for commuting (Abrahamse et al., 2009). According to Heinen (2011), it is found that subjective norm only influenced the decision to commute by bicycle over short distances. Subjective norm is measured on the basis of TPB, and it is determined by the question "To what extend to do people in your surroundings think you should travel by bicycle to work?" (Heinen, 2011).

In contrast, there are other studies involved subjective norm, but it appeared no significant effects on behavioral intention (Chau & Hu, 2002). A research showed that there is no evidence for subjective norms as a predictor of intentions after controlling for other variables is worth considered (Cooke, Sniehotta & Schuz, 2006). It is critical that subjective norms appear as separate factors from intention as they are not related where each of them may contribute independently towards behavior (Field et al., 1993). Armitage & Conner (2001) revealed that it may be due to improper measurement since there were many studies applied single-item indicator to measure subjective norms. According to Johnston & White (2004), the weakest link of TRA is the relationship between subjective norm and intentions. It is explained in a study that, minorities of people are under normative control, which leads to failure in considering these minorities that create a small but consistent effects (Trafimow & Finlay, 1996).

5.6 Perceived behavioral control

Perceived behavioral control is defined as the extent to which a person feels able to enact the behavior or people's perceptions about their ability to perform a behavior (Terry & O'Leary, 2011). Perceived behavioral control has an impact on intentions and actions as it deals with an individual's perception of the ease or difficult about performing the behavior (Barua, 2013). Perceived behavioral control refers to the degree of capability and control that an individual perceives over performing a specific behavior (Ajzen, 1991). Thus, those who perceive a higher degree of personal capability, and control tends to have stronger behavioral intentions to engage in a certain behavior (Ajzen, 1991).

In particular, when people believe they have more resources such as time, money and skills, their perceptions of control are high and hence their behavioral intentions increase (Kim & Chung, 2011). For example, we are more likely to involve in interested activities that we have control over, and we will carry out activities that we are not able to control. Therefore, it is assumed that intention to use the bike sharing system is higher when consumers perceive more control over using this system.

According to (Ajzen, 1991), perceived behavioral control is regarded as a crucial factor predicting consumer' intentions to conduct behaviors. Besides that, Gronhoj, Larsen, Chan & Tsang (2012) state that perceived behavioral control is a second determinant followed by attitudes in predicting behavioral intention. When researchers want to identify the intention of the population often involve perceived behavioral control in their research. For instance, perceived behavioral control used to investigate the intention of public transport users to use routes with transfers (Chowdhury & Ceder, 2013) and predicting speeding intention of young drivers (Cestac, Paran & Delhomme, 2011). Moreover, Haustein and Hunecke (2007) stated that perceived behavioral control was the best indicator to predict the use of environmentally friendly modes of transport (public transport, bicycle, walking). In addition, results of research made by Suki & Suki (2015) showed that the link between perceived behavioral controls positively affects students' intention to engage in environmental activities and green initiatives on campus was significantly proven.

Contrarily, some studies result still showed that perceived behavioral control is not significant to predict intention. For instance, in the study of Freberg (2013) showed that perceived behavioral control did not predict intention to comply with a food recall message; in the study of Fieldinga, McDonald & Louis (2008) showed that perceived behavioral control did not significantly impact intention to engage in environmental activism, and in the study of Smith (2015) showed that no statistically significant relationship was found between perceived behavioral control and intention to use evidence-based critical thinking (EBCT) teaching strategies. Thus this research has to conduct to determine whether perceived behavioral control will affect the intention of students to use the bike sharing system in campus.

6. Methodology

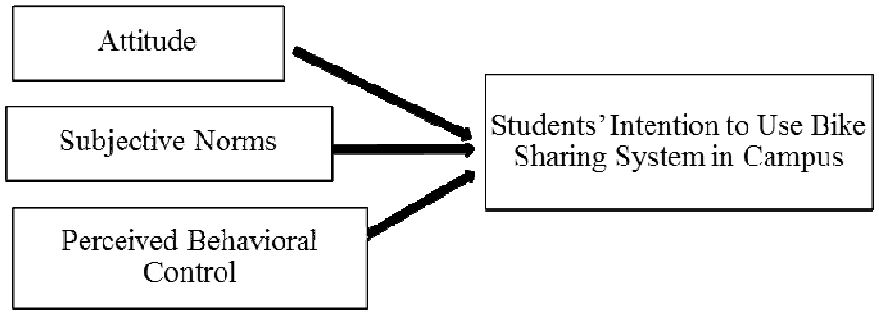

Figure 1: Research Framework of Students' Intention

6.1 *Research Hypotheses*

H1: There is a significant relationship between attitude and students' intention to use the bike sharing system in campus.
H2: There is a significant relationship between subjective norms and students' intention to use the bike sharing system in campus.
H3: There is a significant relationship between perceived behavioral control and students' intention to use the bike sharing system in campus.

6.2 *Research Design*

The research is designed as non-experimental, which do not involve manipulation of situation, circumstances or experience of respondents. A correlation study is chosen to examine the relationships between the predictor variables (attitude, subjective norms and perceived behavioral control) and criterion variable (students' intention). Quantitative approach is used to conduct the research. A non-contrived setting is used for the research where events will normally occur in natural environment. The unit of analysis in the study is individual as the data is collected from an individual student. In the research, a cross-sectional study was adopted.

6.3 *Sampling and Data Collection*

The sample size chosen as the research is 375 UUM full time undergraduate students based on Krejcie and Morgan's (1970) formula. In the study, proportionate stratified random sampling method is applied where population is divided into three strata, which are gender, race and college. The gender proportion is divided into 27%. Is male and 73% is female. In race aspect, the proportion for Malay is 50%, Chinese. Is 30%, Indian is 15% and other are 5% based on researchers' observation. While the proportions for colleges were divided to COB is 41%, COLGIS is 38% and CAS is 21%. In the study, primary data is collected through a questionnaire. Self-administered questionnaires are conducted at the research where questionnaires were printed out and distributed by researchers to respondent at COB, CAS and COLGIS building in UUM.

6.4 *Measurement Scale*

A set of a structured questionnaire with Likert seven-point rating scale was used. This scale is used to indicate the degree of agreement for each criterion, with 1 (extremely agree) as minimum and 7 (extremely disagree) as the maximum. The construction of the questionnaire is adopted from Ryu, Ho & Han (2003) which based on TPB model approach. In the research, intention statements are measured with bipolar scale from "extremely agree" to "extremely disagree. Besides that, attitude is measured where adjectives are rated in bipolar continua in which scores for each set of paired adjectives. Whereas the subjective norm is measured in bipolar scale such as "should not" to "should" and "disapprove" to "approve." Lastly, perceived behavioral control is measured in bipolar scale from "extremely disagree" to "extremely agree" in a statement.

7. Data Analysis

The reliability test was assessed in the study to measure the internal consistency. The higher the Cronbach's alpha score, the higher the internal consistency reliability. Pearson correlation is used to measure the strength and direction of linear relationship between an independent variable and dependent variables involved in the study. The coefficient of correlation shows the extent to which changes on the value of one variable are correlated to changes to the value of the other (Udovičić, et al., 2007). In the study, multiple regression analysis will be used to determine the relationship of dependent variable with the three independent variables for the study. Multiple regression analysis is used to describe, estimate or predict causal relationships among a dependent variable with two or more independent variables.

8. Findings

Table 1: Cronbach's alpha value for variables.

Variables	Item	Alpha Cronbach Value
Attitude	5	0.945
Subjective Norm	3	0.886
Perceived Behavioral Control	4	0.864
Intention	4	0.947

According to Sekaran & Bougie (2013), reliability less than 0.6 are considered to be poor,

those in 0.7 is acceptable and those over 0.8 are good. In the research, Cronbach's alpha for the four variables score ranges from 0.864 to 0.947 as shown in Table 1. Hence, all the variables have been proven to be reliable and consistent.

Table 2: Correlation between independent and dependent variables

		Attitude	Subjective Norm	Perceived Behavioral Control	Intention
Attitude	Pearson Correlation	1	.692(**)	.734(**)	.770(**)
	Sig. (2-tailed)		.000	.000	.000
Subjective Norm	Pearson Correlation	.692(**)	1	.648(**)	.708(**)
	Sig. (2-tailed)	.000		.000	.000
Perceived Behavioral Control	Pearson Correlation	.734(**)	.648(**)	1	.732(**)
	Sig. (2-tailed)	.000	.000		.000
Intention	Pearson Correlation	.770(**)	.708(**)	.732(**)	1
	Sig. (2-tailed)	.000	.000	.000	

** Correlation is significant at the 0.01 level (2-tailed).

From table 2, the p-value for all the four variables is equal to 0.000 at which it is less than α value of 0.01. So, there is a statistically significant correlation between independent variables (attitude, subjective norm and perceived behavioral control) and dependent variable (intention) respectively. There is a positive relationship between all the independent variables to intention.

Table 3: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.828(a)	.685	.683	.73700

Table 4: ANOVA table

Model		Sum of Squares	Df	Mean Square	F	Sig.
1	Regression	438.653	3	146.218	269.193	.000(a)
	Residual	201.516	371	.543		
	Total	640.169	374			

Table 5: Coefficient table

Model		Unstandardized Coefficients		Standardized Coefficients	T	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.005	.110		-.050	.960
	Attitude	.428	.053	.381	8.062	.000
	Subjective Norm	.285	.046	.260	6.176	.000
	Perceived Behavioral Control	.333	.052	.284	6.348	.000

Multiple regression analysis was conducted to test the extent to which TPB elements influence students' intention. There is a significant relationship between the independents' variables and dependent variable, where F = 269.193 (Table 4) and p-value = 0.00 ($\alpha < 0.05$). In other words, it can say that the model in general has good predictive capabilities. R-square (R^2) value indicates how much of the dependent variable can be explained by the independent variables. Based on Table 3, it has revealed R^2 is 0.685, which means 68.5% variability of students' intention to use the bike sharing system in campus can be explained by three independent variables such as attitude, subjective norm and perceived behavioral control. Based on Table 5, all of the predictors significantly contributed to predict intention where attitude is the best predictor (β=0.381), followed by perceived behavioral control (β=0.284) and subjective norm (β=0.260).

Table 5 shows the relationship exists between the independent variables and dependent variable.

H1: There is a significant relationship between attitude and students' intention to use the bike sharing system in campus.
The p-value for attitude is 0.000 at which it is less than α value of 0.05. Hence, it can conclude that there is a significant relationship between attitude and students' intention to use the bike sharing system in campus. Therefore, H_1 is accepted.

H2: There is a significant relationship between subjective norms and students' intention to use the bike sharing system in campus.
Besides that, the p-value for subjective norm is 0.000 at which it is less than α value of 0.05. Hence, it can conclude that there is a significant relationship between subjective norm and students' intention to use the bike sharing system in campus. Therefore, H_2 is accepted.

H3: There is a significant relationship between perceived behavioral control and students' intention to use the bike sharing system in campus.
In addition, the p-value for perceived behavioral control is 0.000 at which it is less than α value of 0.05. Hence, it can conclude that there is a significant relationship between perceived behavioral control and students' intention to use the bike sharing system in campus. Therefore, H_3 is accepted.

9. Discussion

The research framework theorized that attitude, subjective norm and perceived behavioral control will influence students' intention to use the bike sharing system in campus based on Theory of Planned Behavior (TPB). The results from this study support the model where statistical results show all independent variables were significantly correlated with intentions.

It is consistent with the findings of Moan & Rise (2011), Yap & Sabaruddin (2008) and Kassem et al. (2003).

All TPB components were significant predictors as expected. Importantly, the present study revealed that attitude is the strongest predictor of intention in the use on the bike sharing system in campus. Attitude exerted the strongest impact on intentions ($r = 0.770$, $p < 0.01$), followed by perceived behavioral control ($r = 0.732$, $p < 0.01$) and subjective norm ($r = 0.708$, $p < 0.01$). It is consistent with the findings of Yap & Sabaruddin (2008) and Moan & Rise (2005) where attitude is the strongest predictor toward intention. From the findings of the study, attitude has a significant and positive effect on students's intention. This is because those with high positive attitudes appeared to have greater intentions to the intent to use the bike sharing system in campus, which is supported by previous studies (Alam & Sayuti, 2011; Mir & Rehman, 2013). This meant that the persons will, firstly, consider their attitude before they decide on whether or not to use it. For example, when they feel that using the bike sharing system beneficial, pleasant, good, valuable and enjoyable, then they will intend to use it.

Besides attitude, perceived behavioral control is the second significant predictor of the intention to use the bike sharing system in campus. This finding is consistent with previous study of Grønhøj, Larsen, Chan & Tsang (2012) which stated that perceived behavioral control is a second determinant followed by attitudes in predicting behavioral intention. In this study, perceived behavioral control also made a particular contribution to the prediction of intentions. This indicates that many respondents were concerned with their ability to overcome obstacles of using the bike sharing system that might prevent them from conducting out their intentions to use the system. The findings also showed, perceived behavioral control is also has significant and positive effect on students's intention. From the result, respondents tend to have stronger behavioral intentions to use the system in campus because of their high self-efficacy and controllability. Respondents will intend to engage the behavior when they believe that they have capability and controllability to deal about the difficulty of using the bike sharing system.

In addition, the result from this study showed that subjective norm had least influence on students' intention compared to attitude and perceived behavioural control. The findings is consistent with the results of previous study of Milković & Štambuk (2015) where subjective norm was the weakest predictor for the behavioral intention of all TPB components. One plausible justification for the least significant linkage between subjective norm and intention is related to present knowledgeable status of the system. This is because of insufficient information and promotion of the bike sharing system that should be provided by government, NGOs and other private sectors. The system is not yet wide-scale implemented in Malaysia, so there is less social pressure to influence their decision. Respondents' family, friends and colleagues are less knowledgeable about the system, hence respondents receive less pressure from them. However, the results indicate that respondents are still concern and influenced by the views and thoughts of others regarding the intended behavior. For instance, their parents or lecturers may want them to use the system in campus, then they will intend to perform the intended behavior. The correlation between independent variables (attitude, subjective norm and perceived behavioral control) and dependent variables (intention) are in the range of positive relationship based on Pearson Correlation Analysis. Moreover, attitude is the strongest factor that affecting intention to use the bike sharing system in campus compared to subjective norm and perceived behavioral control based on Multiple Regression Analysis.

10. Conclusion

As a conclusion, this study will be beneficial to UUM by offering valuable information regarding students' intention to use the bike sharing system in campus. Based on the findings from this study, it showed that students' intention to use the bike sharing system is high. Moreover, as mentioned earlier in the report, university is an ideal target for students to commute within short distance using the bike sharing system. Thus universities in Malaysia are suggested to implement the system as a sustainable solution to create a green campus.

Besides that, the findings showed that perceived behavioral control is the second strong variable which can influence students' intention. Therefore, the administrator of universities should had a plan to minimize the obstacles that will be faced by the bike sharing system users. Administrators should build the separate lanes, design for bicycle that separated user from general traffic flow, convenience of leasing and returning procedures of bicycles, night lighting facility of the bicycle lanes, sufficient bicycles docking station, bicycles racks, equipment, installation, maintenances center and GPS system.

Administrator should provide a roof cover bike lanes if possible. This is because in a previous study of Imani et al. (2014), it is observed that people are more likely to use a bicycle sharing system under good weather conditions. Besides, in the study of Jalalkamali & Ghraeib (2012) on the biking potentials of Malaysian students in UITM campus, it has been concluded that topography of the university, and the weather constraints are the most influenced factors to use the bicycle. In addition, the study of Jen & Shih (2015) expressed that system cognition and environmental cognition are important factors that effect people's intentions to use YouBike (the first Public Bike System in Taipei) for commuting based upon the cross-over analysis. By doing so, students will believe that using the bike sharing system is easier and safer, thus encouraging them to recognize and appreciate the sustainable mode of transportation effectively.

Greater understanding of factors that affect students' intention towards the bike sharing system will help in planning and implementation process in the future. Moreover, it also helps to understand the students' intention towards using sustainable transport and validate their awareness on importance of sustainable transportation. Since the system is not yet being implemented in UUM campus, and the respondents to this study not yet experience the system in real, thus future research should also replicate the study to other universities in Malaysia that had implemented the systems or replicate the study again in UUM after the system is being implemented. This is to generalize the findings from the study and further validate and confirm that attitude, subjective norm and perceived behavioral control is significantly and positively related to students' intention to use the bike sharing system in campus. Lastly, it is recommended that future research should explore the nature and extent under the impact of other possible variables that will influence students' intention to use the system such as environmental factor, system characteristic's factor and safety factor.

Reference

Abrahamse et al. (2009). Factors influencing car use for commuting and the intention to reduce it: A question of self-interest or morality? Transportation Research Part F , 317-324.

Ajzen, I. & Fishbein, M. (1977). Attitude-behavior relations: A theoretical analysis and review of empirical research. Psychological Bulletin , 84 (5), 888-918.

Ajzen, I. (1985). From intentions to actions: A theory of planned behavior. In J. K. (eds), Action Control (pp. 11-39). Springer Berlin Heidelberg.

Ajzen, I. (1991). The Theory of Planned Behavior. Organizational Behavior and Human Decision Processes, 179-211.

Ajzen, I. (2014). The theory of planned behaviour is alive and well, and not ready to retire: a commentary on Sniehotta, Presseau, and Araújo-Soares. Health Psychology Review, 1-6.

Ajzen, I., Joyce, N., Sheikh,S. & Cote, N.G. (2011). Knowledge and the prediction of behavior: The role of information accuracy in the theory of planned behavior. *Basic And Applied Social Psychology* , 101-117.

Alagbe,O.A. & Alalade,G.M. (2013). Implications of constructed Wetlands waste water treatment for sustainable planning in developing world. *Universal Journal of Environmental Research and Technology*, 597-606.

Alam, S.S. & Sayuti, N.M. (2011). Applying the Theory of Planned Behavior (TPB) in halal food purchasing. *International Journal of Commerce and Management*, 16.

Allan, C. (2015, July 16). Health and cycling. Retrieved October 9, 2015, from The National Cycling Charity : http://www.ctc.org.uk/campaigning/views-andbriefings/health-and-cycling.

Armitage, C.J. & Conner, M. (2001). Efficacy of the Theory of Planned Behaviour: A meta-analytic review. British Journal of Social Psychology, 471-499.

Ashley, J. (2012). Bike sharing as alternative transportation at Bridgewater State University. Undergraduate Review, 16-25.

Audi, R. (1991). Intention, cognitive commitment, and planning. In Synthese (Vol. 86, pp. 361-378). Netherlands: Kluwer Academic Publisher.

Bachand-Marleau, J., Lee, B. & El-Geneidy, A. (2012). Better understanding of factors influencing likehood of using shared bicycle systems and frequency of use. Journal of the Transportation Research Board , 2314, 66-71.

Bagozzi, R. P. (1992). The self-regulation of attitudes, intentions, and behavior. Social Psychology Quarter , 55 (2), 178-204.

Barua, P. (2013). The moderating role of perceived behavioral control: The literature criticism and methodological considerations. International Journal of Business and Social Science, 4(10), 57-59.

Blondel, B., Mispelon, C. & Ferguson, J. (2011). *Quantifying CO2 savings of cycling.* Brussel.

Bonfield, E. H. (1974). Attitude, social influence, personal norm, and intention interactions as related to brand purchase behavior. Journal of Marketing Research (JMR). , 11 (4), 379-389.

Cestac J., Paran, F. & Delhomme, P. (2011). Safety Science, 49(3), 424-432.

Chandon, P., Morwitz, V.G. & Reinartz, W.J. (2005). Do intentions really predict behavior? Self-generated validity effects in survey research. Journal of Marketing , 1-14.

Chau, P.Y.K. & Hu, P.J.H. (2002). Investigating healthcare professionals' decisions to accept telemedicine technology: An empirical test of competing theories. Information & Management , 39, 297-311.

Chowdhury, S. & Ceder, A. (2013). A psychological investigation on public-transport users' intention to use routes with transfer. International ournal of Transportation, 1(1), 1-20.

Cooke, R., Sniehotta, F. & Schuz, B. (2006). Predicting binge-drinking behavior using an extended TPB: Examining the impact of anticipated regret and descriptive norms. Alcohol & Alcoholism , 42 (2), 84-91.

Dijst, M., Rietveld, P. & Steg, L. (2013). Individual needs, opportunities and travel behavior: A multidisciplinary perspective based on psychology, economics and geography. In B. A. Van Wee, The transport system and transport policy (p. 30). UK: Edward Elgar.

Doyle, J. (2014). *Managing the environmental impacts of transport.* Victoria: Victorian Auditor-General.

Farahbod, F., Azadehdel, M., Mofidi, M.K., Shahabi, S., Khoshamooz, H., Pazhouh, L.D., Ghorbaninejad, N. & Shadkam, F. (2013). The relationship between trait emotional intelligence and entrepreneurship attitudes and intentions. Journal of Public Administration and Policy Research, 84-85.

Fein, S. & Hilton, J.L. (1990). Attitudes toward Groups and Behavioral Intentions toward individual Group Members: The Impact of Nondiagnostic Information. Journal of Experimental Social Psychology, 103.

Fieldinga, K.S., McDonald, R.& Louis, W.R. (2008). Theory of planned behaviour, identity and intentions to engage in environmental activism. Journal of Environmental Psychology, 28(4), 318-326.

Fishbein, M. & Ajzen, I. (1975). Prediction of Behavior. In M. &. Fishbein, Belief, attitude, intention and behavior: An introduction to theory and research (pp. 335-383). Addison-Wesley.

Freberg, K. (2013). Using the theory of planned behavior to predict intention to comply with a food recall message. Health Communication, 359-365.

Fund, A., Hall, A., Gorby, C., Siegel, D., Wolf, E., Burdett, J. & Gathunguri, M. (2012). Sustainable transportation at the University of Kansas. 1-19.

Gardner, C. & Gaegauf, T. (2014). The impact of bikesharing. 1-13.

Geib, C. W. (1992). Intentions in means-end planning (Dissertation Proposal). 11-13.

Ghorban, Z. S. (2012). Brand Attitude, Its Antecedents and Consequences. Investigation. IOSR Journal of Business and Management, 31-34.

Godin, G. & Kok, G. (1996). The theory of planned behavior: A review of its applications to health-related behaviors. American Journal of Health Promotion , 11 (2), 87-98.

Goldsby, T. J., Iyengar, D. & Rao, S. (2014). *The critical role of transportation in business and the economy.* Pearson Ft Press.

Grønhøj, A., Larsen, T. B., Chan, K. & Tsang, L. (2012, May 12). Using theory of planned behavior to predict healthy eating among Danish adolescents. *Health Education, 113*(1), 4-17.

Haustein, S. & Hunecke, M. (2007). Reduced Use of Environmentally Friendly Modes of Transportation Caused by Perceived Mobility Necessities: An Extension of the Theory of Planned Behavior. Journal of Applied Social Psychology, 37(8), 1856-1883.

Heda, A. (2012). Implementation of a campus bike sharing program for Washington University's Danforth Campus. 15-16.

Heinen, E. (2011). Bicycle commuting. Netherlands: IOS Press.

Hook, W. (2005). Training course: Non-motorized transport. *Environment and Infrastructure Sector Project "Transport Policy Advice"* , 1-120.

Imani, A., Eluru, N., El-Geneidy, A., Rabbat, M. & Haq, U. . (2014). How does land-use and urban form impact bicycle flows: Evidence from the bicycle-sharing system (BIXI) in Montreal. Transport Geography.

Isah, U.G. & Garba A.S. (2015). Analysis of students'Attitudes Towards Self-Employment Intention in Tertiary Institution in Nigeria. International Journal of Small Business and Entrepreneurship Research, 2.

Jain,S. & Pant,P. (2010). Environmental management systems for educational institutions. *International Journal of Sustainability in Higher Education* , 236-238.

Jalalkamali, N. & Ghraeib, F.N.M. (2012). The Cycling Potentials of Malaysian Students in UiTM. ASEAN Conference on Environment-Behaviour Studies (pp. 941 – 949). Bangkok, Thailand: Procedia - Social and Behavioral Sciences.

Jen, T.P. & Shih, Y.P. (2015). User behavior analysis of the public bike system in Taipei. International review for spatial planning and sustainable development, 3(2), 39-52.

Johnston, K.L. & White, K.M. (2004). An examination of the individual difference approach to the role of norms in the Theory of Reasoned Action. Journal of Applied Social Psychology , 34 (12), 2524-2549.

Kaplan, S., Manca, F., Nielsen, T.A.S. & Prato, C.G. (2014). Intentions to use bike-sharing for holiday cycling: an application of the Theory of Planned Behavior. 1-18.

Kassem et al. (2003). Understanding soft drink consumption among female adolescents using the Theory of Planned Behavior. *Health Education Research , 18* (3), 278-291.

Kenney, G. (2012, May). *Bicycle Sharing Feasibility Study.* Retrieved October 7, 2015, from University of Illinois at Urbana-Champaign: https://icap.sustainability.illinois.edu/files/project/107/Bicycle%20Sharing%20Feasibility%20Study%20Final%2011-30-12.pdf

Kim, H.Y. & Chung, J.E. (2011). Consumer purchase intention for organic personal care products. Journal of Consumer Marketing , 40-47.

Kisner, C. (2011). Integrating bike share programs into a sustainable transportation system. *National League of Cities* , 1-4.

Krithika, J. & Dr. B.Venkatachalam. (2014). A study on impact of subjective norms on entrepreneurial intention among the business students in Bangalore. Journal of Business and Management , 16 (5), 48-50.

Kusumawati, A., Halim, A., Said, D. & Mediaty. (2014). Effects of Intention Mediation towards Attitude, Subjective Norms and Perceived Behavioral Control on Taxpayers' Behavior. Journal of Research in Business and Management, 28.

Kwan, B.M. & Bryan, A.D. (2010). Affective response to exercise as a component of exercise motivation: Attitudes, norms, self-efficacy, and temporal stability of intentions. Psychol Sport Exerc., 10.

Lapinski, M.K. & Rimal, R.N. (2005). An explication of social norms. Communication Theory , 127-147.

Lee, M.C. (2010). An extension of the expectation–confirmation model. Computers & Education 54, 514.

Lester, P. (2010, December 3). *Riding to Sustainability: Bike Sharing Takes Off*. Retrieved September 22, 2015, from energy.gov: http://energy.gov/articles/ridingsustainability-bike-sharing-takes.

Litman, T., & Burwell, D. (2006). Issues in sustainable transportation. *Int. J. Global Environmental Issues, Vol. 6, No. 4*, 334.

Makki, S., Surat, M., Che-Ani, A. I, Farkisch, H. & Mokhtarian, H. R. (2012). The importance of design characteristics in walking from students perspective: A case study in Universiti Kebangsaan Malaysia. *Journal of Building Performance, 3*, 42-49.

Mehra, V. & Omidian, F. (2011). Examining Students' Attitudes Towards E-learning: A Case from India. Malaysian Journal of Educational Technology Volume 11, Number 2, 14.

Midgley, P. (2010). Bicycle-sharing schemes: Enhancing sustainable mobility in urban areas. 1-24.

Midgley, P. (2015, September 15). *Connectivity, safe bike lanes key to bike-share success*. Retrieved September 22, 2015, from ecosmagazine.com: http://www.ecosmagazine.com/paper/EC14212.htm

Milković, M. & Štambuk, M. (2015). To Bike or not to Bike? Application of the theory of planned behavior in predicting bicycle commuting among students in Zagreb. 187-205.

Mir, I.A. & Rehman, K.U. (2013). Factors Affecting Consumer Attitudesand Intention toward user-generated product content on youtube. *Management & Marketing Challenges for the Knowledge Society*, 643.

Moan, I.S. & Rise, J. (2011). Predicting intentions not to "drink and drive" using an extended version of the theory of planned behaviour. *Accident Analysis and Prevention , 43*, 1378-1384.

Moan, I.S. & Rise, J. (2005). Quitting smoking: Applying an extended version of the Theory of Planned Behavior to predict intention and behavior. *Journal of Applied Biobehavioral Research , 10* (1), 39-68.

Moran, R. (2004). Anscombe on 'Practical Knowledge'. In J. H. (eds.), Royal Institute of Philosophy Supplement (pp. 43-68). Cambridge University Press.

NRDC. (2013, June). *Bike sharing coming soon to a city near you*. Retrieved September 22, 2015, from Natural Resources Defense Council (NRDC): http://www.nrdc.org/thisgreenlife/1306.asp

Okyere, D. K. (2012). Sustainability of the urban transport system of Kumasi. 1-2.

Parkes, S.D., Marsden, G., Shaheen, S.A. & Cohen, A.P. (2013). Understanding the diffusion of public bikesharing systems: Evidence from Europe and North America. *Journal of Transport Geography* , 94-103.

Peng, N., Hackley, C., Tiwsakul, R.A. & Chou, C. (2011). Antecedents of luxury brand purchase intention. Journal of Product & Brand Management , 457-467.

Rastogi, R. (2011). Promotion of non-motorized modes as a sustainable transportation option: Policy and planning issue. *Current Science , 100* (9), 1340-1348.

Rodrigue, J. P. & Notteboom, T. (2013). Transportation and economic development. In J.P. Rodrigue, *The geography of transport system (3rd edition)* (p. 416). New York: Routledge.

Rogers, R. W. (1983). Protection motivation and self-efficacy: A revised theory of fear appeals and attitude change. Journal of Experimental Social Psychology , 153-175.

Ryu, S., Ho, S.H. & Han, I. (2003). Knowledge sharing behavior of physicians in hospitals. *Expert Systems with Applications , 25* (1), 113-122.

Sekaran, U. & Bougie, R. (2013). *Research Methods for Business* (6th ed.). United Kingdom: Wiley & Sons Ltd.

Shah, S.S.H., Aziz, J., Jaffari, A.R., Waris, S., Ejaz, W., Fatima, M. & Sherazi, S.K. (2012). The Impact of Brands on Consumer Purchase Intentions. Asian Journal of Business Management, 107-109.

Shaheen,S.A., Guzman,S. & Zhang,H. (2010). Bikesharing in Europe, the Americas, and Asia. *Journal of the Transportation Research Board* , 159-167.

Shaheen,S. & Guzman,S. (2011). Worldwide bikesharing. 22-27.

Sheeran, P. (2002). Intention - behavior relations: A conceptual and empirical review. European Review of Social Psychology , 1-36.

Sheeran, P. & Taylor, S. (1999). Predicting intentions to use condoms: A meta-analysis and comparison of the theories of reasoned action and planned behavior. Journal of Applied Social Psychology , 29 (8), 1624-1675.

Sheppard, B.H., Hartwick. J. & Warshaw. P.R. (1988). The theory of reasoned action: A meta-analysis of past research with recommendations for modifications and future research. Journal of Consumer Research , 15 (3), 325-343.

Smith, A. Y. (2015). Attitude, subjective norm, and perceived behavioral control as indicators for nurse educators' intention to use critical thinking teaching strategies: A structural equation model analysis . 1-191.

Sniehotta et.al. (2014). Time to retire the theory of planned behaviour. Health Psychology Review , 8 (1),1-7.

Sonoff, K. (2012). Bicycle Friendly campus initiatives.

Souza, A.A.D, Sanches, S.P. & Ferreira, M.A.G. (2014). Influence of attitudes with respect to cycling on the perception of existing barriers for using this mode of transport for commuting. Social and Behavioral Sciences , 111-120.

Sotero, D. (2015, Jun 25). *L.A. Metro Board Approves BCycle as Regional Bikeshare Vendor*. Retrieved September 22, 2015, from BCycle: https://www.bcycle.com/single-news-item/2015/06/25/l.a.-metro-board-approvesregional-bikeshare-vendor.

Suki, N.M. & Suki, N.M. (2015). Students' Intention to Engage in Campus Environmental activities and green Initiatives: A structural equation modelling approach. 2nd Regional Conference on Campus Sustainability: Capacity Building in Enhancing Campus Sustainability, (pp. 21-36).

Tahzib, I. B.& Zvijakova. (2012). Environmental impact of land transport . *Transfer inovacii 24/212* , 70-77.

Terry, D. J. & O'Leary, J. E. (2011, Jun). The theory of planned behaviour: The effects of perceived behavioural control and self-efficacy. *British Journal of Social Psychology, 34*(2), 199-220.

Toit, J. L. (2013). Student preference for alternative modes of transport at University of Pretoria, South Africa. *WIT Transaction on Ecology and The Environment, 173*, 351-353.

Trafimow, D. & Finlay, K.A. (1996). The importance of subjective norms for a minority of people: Between subjects and within-subjects analyses. Personality and Social Psychology Bulletin , 22 (8), 820-828

Udovičić, M., Baždarić, K., Bilić-Zulle, L. & Petrovečki, M. (2007). What we need to know when calculating the coefficient of correlation. *Biochemia Medica*.

Van Hooft, E.A.J. & De Jong, M. (2009). Predicting job seeking for temporary employment using the theory of planned behaviour: The moderating role of individualism and collectivism. Journal of Occupational and Organizational Psychology , 82, 295-316

Wakeland, W., Cholette, S. & Venkat, K. (2012). Food transportation issues and reducing. *Green Technologies in Food Production and Processing* , 211-236.

Watjatraku, B. (2013). factors affecting students' intentions to study at universities adopting the "student-as-customer" concept. . International Journal of Educational Management , 676-693.

Wine, J. (2012). Bicycle share feasibility study: New Orleans.

Wong, J. K. (1985). Explaining intention-behavior discrepancy--A paradigm. Advances in Consumer Research , 12, 378-384.

Yap, S.H. & Sabaruddin, N.A. (2008). An extended model of Theory of Planned Behaviour in predicting exercise intention. *International Business Research , 1* (4), 108-122.